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The Veterinary Services of the United States Army*

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The Medical Department of the United States Army is composed of three divisions, the Medical, Dental and Veterinary. The Veterinary Corps, as a part of the Medical Department, is charged in peace and war with duties falling under two definite heads; first, those in connection with the animals of the Army; second, those concerned with the food supplies of animal origin for the troops.

As regards animals, the Veterinary Corps is responsible for investigating the hygiene and the sanitary condition of the animals of the Army and making recommendations with reference thereto; advising as to methods of animal management in so far as they concern animal health and efficiency; instructing military personnel in military animal sanitation and management and horse-shoeing; the examination of forage when procured, in storage and at issue; the evacuation and care of sick and wounded animals; the physical examination of animals; the management and control of veterinary military hospitals and all other veterinary units; and the control, training, instruction and assignment to duty of the commissioned and enlisted personnel of the Medical Department assigned to the Veterinary Service.

The objects of this phase of the Veterinary Service are to protect the health and preserve the physical efficiency of the animals of the Army. These objects are to be attained by:—

1. The application of the principles of veterinary sanitary science to maintain animals in a correct environment as regards their shelter, restraint, handling, feeds and feeding, grooming, work and exercise, shoeing, clothing and equipment with a view to eliminating so far as practicable the causes of physical inefficiency.

2. The initiation of suitable protective measures to prevent the introduction of communicable diseases and the prompt detection and proper handling of such cases, including the adoption of the necessary suppressive measures to limit their duration or extension.

3. The reduction of animal losses and inefficiency by the prompt discovery of the sick and wounded, their separation from the well, their evacuation, their segregation in veterinary hospitals, and the application of curative measures.

4. The physical examination of animals prior to purchase and at other times with a view to ensuring the acquisition of only sound animals and the prompt and economical disposal of the unsound.

As regards food supplies, the Veterinary Corps is responsible for investigating the soundness of quality and sanitary condition of meats and meat food and dairy products prior to and at the time of purchase, while they are in storage and at the time of issue; the sanitary condition of establishments, storehouses, freezers, refrigerators, refrigerating space in cars and ships and other places in which such supplies are manufactured, handled, stored, shipped or issued; the sanitary condition of dairies and milk herds supplying troops; and for making recommendations with reference thereto, and the instruction of veterinary personnel in the performance of all of these duties.

Such inspections of these supplies as to quality and the sanitary conditions of the establishments are carried out under veterinary inspection procedures as are laid down under appropriate Army Regulations.

The U.S. Government Meat Inspection Act provides for the inspection by the Bureau of Animal Industry's veterinarians of meats intended for interstate shipment. Whether of intrastate or interstate origin, to be acceptable all meat and meat food products purchased by the Army as part of the ration, or by organisation messes, or other restaurants operating within the limits of an Army post must have been previously inspected and passed by the Bureau of Animal Industry and bear the stamp of that agency. It is not intended that the Veterinary Corps of the Army duplicate this work, but as an Army agency it takes over the inspection of supplies purchased, accepting the findings of the Bureau of Animal Industry as far as they go, and completing for the Army the inspection to the point of the issue to troops.

Under circumstances where the inspection of meat and meat food products cannot be carried out as outlined previously, the fitness of such supplies will depend solely on inspections made by a veterinary officer, who will conduct both *ante-mortem* and *post-mortem* examinations and stamp such of them as are passed for consumption by the troops.

Likewise all milk and milk products must pass a rigid inspection. The milk plants must meet certain requirements regarding sanitation, equipment and processing before they can be approved. The inspection of milk plants will include the inspection of all dairy farms supplying the plant. A veterinary dairy inspection consists of an investigation into the sanitation of the dairy and all the parts, equipment, employees, methods of operation, and the hygiene and health of the dairy animals. The object of this inspection is the prompt detection of insanitary conditions and the initiation of corrective measures, thereby ensuring such degree of sanitary supervision over the production of the milk at its source as will most effectively protect the health of the troops.

The dairy animals must at all times be subject to careful scrutiny as to their condition of health. A physical examination is made of all the animals in a herd at the time they are approved as a source of supply and generally once monthly as long as the supply is used. The dairy animals MUST be free of tuberculosis. Milk or milk products will not be accepted from premises where diseased animals are found until such animals are removed and the premises properly cleaned and disinfected. The milk must be cooled immediately after milking and kept cool until delivered to the milk plant for pasteurisation.

Every person connected with a dairy farm whose work brings him into contact with the production, handling, storage, transportation or equipment; and every person connected with a pasteurisation plant whose work brings him in contact with the production, handling, storage, transportation or equipment, will furnish such information, permit such examination and submit such laboratory specimens as the Surgeon of the Medical Department may require for the purpose of determining their freedom from disease and infection.

In the United States, we have Government-owned stallions which are "farmed out" among the breeders and farmers, for breeding purposes. In this way, types of horses and mules are produced for future Army requirements and purchases.

A laboratory service is set up at the Army Veterinary School, Washington, D.C., and elsewhere in the field as required. In these laboratories samples of food products are analysed; vaccines used by the Veterinary Corps are prepared; and general investigations of animal diseases are carried out.

The Army Veterinary School trains and instructs the enlisted personnel of the Veterinary Service.

While I have been brief in my remarks, I have tried to give you an overall picture of the work of the Veterinary Corps in the United States Army. If there are any questions that you wish to ask, I will endeavour to answer them to the best of my ability.

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Discussion

Mr. SWEENEY: Was pasteurisation compulsory in America? He noticed that Colonel Arundel said that all the milk supplied to the American Army had to come through approved pasteurisation plants, and that the milk supply was from T.T. herds.

Colonel ARUNDEL having replied that all milk had to be pasteurised for Army use, Mr. HALL enquired if the same rigid inspections were applied to the civilian population as to the Army with reference to milk and meat supply?

Colonel ARUNDEL: Under certain circumstances, yes. As they knew, there were 48 states in the U.S.A. Animals that were slaughtered and the meat sold wholely within one state did not have to be slaughtered under U.S. Government veterinary inspection. These animals were slaughtered under Municipal inspection.

When the meats and meat products were to be shipped from one state into another, the animals would have to be slaughtered in a packing establishment having U.S. Government Veterinary Inspectors. All meats and meat products used by the U.S. Army must be so slaughtered and inspected.

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In the packing houses they had a certain number of lay inspectors who did a lot of the routine inspection work, *e.g.*, cutting of glands, sanitary work, etc., but the actual passing of the meat was done by the veterinary inspector. Some of the municipalities had sanitary inspectors as well as veterinary inspectors and the former were more concerned with the sanitary surroundings, the water supply and the sewerage disposal on the dairy farms.

Mr. T. H. Jones: Who did Colonel Arundel mean by lay person? Did he mean sanitary inspectors. If not, what part did sanitary inspectors play in the control of tuberculosis?

Colonel Arundel: A sanitary inspector was a sanitary engineer. He was a graduate of a college of engineering and had specialised in sewerage disposal, water supply and such allied engineering subjects. He had nothing to do with the veterinary profession or anything dealing with animal diseases. The lay inspector had to have a High School education, with definite background and training, and was a whole-time employee of the U.S. Government and stationed at the packing house.

Replying to Mr. J. C. Hill, who enquired if a veterinary inspector was responsible for new construction of cowsheds and alteration of existing cowsheds, Colonel Arundel replied in the affirmative, adding that the veterinary inspector was responsible for making any recommendations as to new construction or alterations needed to bring the dairy up to the required standards. In the U.S. Public Health Code, the requirements were outlined, giving detailed plans for its construction, as well as the amount of floor space per cow, the amount of cubic feet of air space, windows, ventilation, etc., for a model dairy barn.

Mr. Thomas (Pontypridd): According to the Coal Mines Act of 1911, no horse could work in the mines unless it had passed the mallein test. Did this apply in America?

Colonel Arundel: He was not in a coal mining section in America. To the best of his knowledge they did not use any horses or mules underground at the present time. Electric trolleys were used for hauling the cars. The horses and mules in the U.S. Army must have passed the mallein test. This test was given when the animals were moved from one camp or station to another and yearly if they had not changed their location.

Replying to Mr. J. C. Hill, he did not know the exact percentage figure for glanders in the United States, but it was very low.

Mr. A. T. Morgan: Was there any control of livestock breeding in America, such as licensing of bulls, and if so, was this done by veterinary inspectors or agriculturalists?

Colonel Arundel: There was no such control. In some of their open range country where the cattle were out in the open, they had laws prohibiting a bull over six months of age running at large, unless he was of registered stock.

Captain W. Davies: To what extent was tuberculosis controlled in the States, and what were the methods of control? Was the incidence of tuberculosis high, medium or low?

Colonel Arundel: At the time the eradication programme was started, the incidence of tuberculosis in the whole of the United States was around 35 per cent. In some of the dairy states it was higher, and in some of the southern states it was very low. Some years before the programme was started, if a farmer had a tuberculous bovine, he could sell and ship it into another state, spreading the disease. As a result of this, the Interstate Health Livestock Law was passed, which prevented the movement of livestock across the border of one state into another unless they were accompanied by a health certificate which was made out by an approved veterinarian, and such examinations made as required by the state of destination. There was a variance in the livestock laws of the different states. For example, you might want to ship a cow from his state of Georgia to Virginia. The cow would have to be free from contagious abortion as well as tuberculosis. Some of the states only required the cattle to be free from tuberculosis.

When the eradication programme was introduced, it was done in co-operation between the states and the Federal Government, and all of the cattle in a given area were tested at the same time. Finally, the entire country was tested and retested, and in 1938 the incidence of bovine tuberculosis was 4/10ths of 1 per cent. All of the states were either accredited or modified accredited areas.

The control of the movement of livestock from one state to another was one of the factors that helped to decrease the incidence of this disease. When a reactor was found it was branded on the jaw with a "T," and killed under U.S. Government supervision and veterinary inspection.

Mr. Ascott: Would Colonel Arundel say a few words on veterinary education in the United States and on unqualified practitioners?

Colonel Arundel: All colleges and universities in the United States required their prospective students to have a High School education. To study veterinary medicine, a student did one year pre-veterinary work and four years of veterinary medicine and surgery at the veterinary college of his choice. Their students only had to pass the studies and examinations at their college, and did not appear before an outside board after each year's study, as did their students here, when they appeared before the Royal College of Veterinary Surgeons. When a student completed his work and passed his final examinations, he was graduated with the degree of Doctor of Veterinary Medicine, "D.V.M." He was then a graduate veterinarian.

Each of the various states had their licensing boards and one appeared before the Board of the state in which one wished to practise and took a comprehensive examination on all veterinary subjects. One would have to take more than one examination if one wished to practise in several adjoining states. If one wished to enter the U.S. Bureau of Animal Industry, one would have to appear before their Board and pass a Civil Service Examination on veterinary subjects. Likewise the candidates for the Veterinary Corps of the U.S. Army appeared before the U.S. Army Examining Board.

With reference to the unqualified practitioners, or as they were commonly called, "quacks," they had their share, he presumed. They had "County Agents," who were graduates of agricultural colleges. They were supposed to assist and help the farmers with farm problems, but they often gave counsel and attempted to diagnose and treat animal diseases, and give preventive inoculations.

In reply to Mr. Hughes (Cardigan), they had quite an outbreak of foot-and-mouth disease in 1914. There was a small outbreak about 1922 in California and another small one some ten years ago in just a few herds on the West Coast. At the present time there was no foot-and-mouth disease in the United States.

Answering Mr. T. H. Jones, a veterinary surgeon in the United States was addressed as "Doctor." In the telephone directory one would be listed as "Dr. ——, D.V.M." The tuberculosis eradication scheme started in the early 1920's.

Mr. F. V. John: What was the general opinion in regard to pasteurisation in the states? Were they satisfied that it cut down milk-borne diseases?

Colonel Arundel: The opinion was such that unless one had pasteurised milk for sale, one could hardly find a market for it. Yes, they were satisfied that it did cut down milk-borne diseases.

In reply to Mr. F. V. John, he would say that there was no one accepted method of identifying cattle. When testing for tuberculosis and contagious abortion they used ear tags. Some of the farmers used tattoo methods, especially if they had registered animals. Branding was also extensively used, especially on the range, where one could identify the animals at a distanee. Using the tattoo mark on the ear, one had to catch and hold the animal to determine the mark. Ear tags or the branding iron were the best means of marking dark cattle.

Mr. L. Hughes: He had been interested to hear of the precautions regarding milk supplied to troops. What he was most interested in, however, was what justification there was for taking those precautions. Did the authorities consider that the troops should have better milk than children?

Colonel Arundel: In answering this question, one must decide what was meant by "authorities." On all of their permanent Army posts in peace-time they had the families of officers and enlisted men. The Army regulations with reference to milk and its supply pertained to all of the milk either consumed by the troops or sold to the families. So as far as any children of these families were concerned, the answer to the question was "no." The children outside of Army camps and establishments secured their milk from civilian milk producers and dealers, and these came under the local municipal milk ordnances and regulations of their respective localities.

VITAMIN D AND RICKETS

The British Paediatric Association have investigated the incidence of rickets in 5,283 children, of whom 106 showed radiological evidence of the disease. An account of the survey is given in a report published by the Stationery Office (9d. net) entitled "The Incidence of Rickets in War-time." On the question of supplements of vitamin D the report states that scientific evidence has clearly shown that vitamin D administered in an adequate dosage and in a suitable form will prevent rickets. But, it adds, certain cases in the groups examined showed an incidence which still gives scope for better prophylactic measures, of which a more extensive use of national "cod-liver oil" compound is certainly an important one.

The investigation was made before the cod-liver oil compound, with its increased vitamin D content, became available, a probable explanation of the fact that 73 per cent. of the children found to be suffering from rickets had received some form of vitamin D prophylaxis. Commenting on the administration of extract of malt with cod-liver oil the report states that the amount of oil contained in the usual dose of the preparation is quite inadequate to prevent rickets and a false security is engendered by its use.—*Pharm. J.*

ANNOTATION

Recent Advances in the Study of Antibacterial Substances Produced by Micro-Organisms

Pasteur and Joubert (1877), who first observed that certain micro-organisms are able to exert antagonistic or antibiotic effects upon other organisms, said in conclusion: "Tous ces fait autorisent peut-être les plus grandes espérances au point de vue thérapeutique." This hope has been realised by the discovery of the remarkable therapeutic drug penicillin. The recent interest in the antagonistic inter-relationships of micro-organisms has led to the preparation of several substances of microbial origin which have marked bacteriostatic and bactericidal properties. Some of these have been isolated in the form of pure chemical compounds, whereas others have so far been demonstrated only in the form of crude preparations containing the active principle.

In this review I should like to deal with those antibacterial substances from bacteria and moulds which have been examined in some detail.

The Antibiotic Substances produced by Bacteria

The first serious attempts to employ an antagonistic substance for curative purposes was made by Emmerich and Loew (1899), who used an extract of an old culture of *Pseudomonas pyocyanea* which was bactericidal to many micro-organisms. The authors ascribed this antagonistic effect to the action of an enzyme termed "Pyocyanase." They claimed that experimental anthrax could be cured by pyocyanase, and suggested its use for the local treatment of diphtheria and other infections. This substance was sold in Germany up till 1936. It has recently been established by Schoental (1941) that the antibacterial activity of pyocyanase is due to at least three different substances, *viz.*, (1) Pyocyanine, the blue pigment which appears in young cultures during the maximal growth of bacteria. (2) A yellow pigment, appearing in older cultures, which has been found to be a derivative of pyocyanine and is identified with α-oxyphenazine. (This substance is produced by Merck & Co. as hemipyocyanine.) (3) An almost colourless oily substance obtained in extracts from two- to three-months-old cultures.

Schoental (1941) concluded from his experiment that pyocyanine, in spite of its strong bactericidal activity, does not appear to be promising for therapeutic purposes owing to its high toxicity and instability. The antibacterial properties of α-oxyphenazine have up till now not been recognised. The main feature of the third antibacterial substance is its strong action on *Vibrio cholerae*, accompanied by a lysis of the vibrios and gel formation.

A second bacterium of especial significance is *Bacillus brevis*, a soil organism which produces an antibiotic substance in liquid media (Dubos, 1939). This agent was shown (Dubos and Cattaneo, 1939; Dubos and Hotchkiss, 1941) to consist of two polypeptides: gramicidin and tyrocidine, which have been isolated in the crystalline state. Tyrothricin, the crude mixture of the two polypeptides, has been used locally with some success for the treatment of infected wounds, but it is too toxic for general administration. Gramicidin and tyrocidine have great chemical interest because they belong to the very small group of crystalline polypeptides (Gordon, Martin and Synge, 1943).

The Antibiotic Substances produced by *Actinomycetes*

The second group of micro-organisms which supply the antibiotic agents is the *Actinomycetes*. In 1924 Gratia and Dath obtained a substance from the culture of *Actinomyces albus* which was able to dissolve certain pathogenic bacteria. The authors suggested later (1934) that suspensions of bacteria which had been dissolved by actinomycetin could be used for immunising purposes and claimed that such mycolysates were more effective than ordinary vaccines. This idea did not find acceptance in medical practice. Waksman and Woodruff (1940) described the bacteriostatic and bactericidal substance produced by a soil organism *Actinomyces antibioticus*. This substance consists of two compounds, designated "Actinomycin A" and "Actinomycin B." The first, "A," is highly pigmented, and is soluble in ether, ethyl alcohol and water. Its aqueous solution is clear. It is highly bacteriostatic, many Gram-positive bacteria being inhibited by dilutions of 1 : 100,000,000. The Gram-negative bacteria are inhibited only by higher concentrations, *i.e.*, 1 : 5,000 to 1 : 10,000. This substance is weakly bactericidal. The second substance, "B," is soluble in ether, soluble with difficulty in alcohol, but insoluble in water. It is weakly bacteriostatic but more actively bactericidal. Both substances are very toxic to experimental animals. In 1942, the same authors added to the list of antibiotic agents from Actinomycetes a new substance named "Streptothricin." The name is derived from the early generic designation, *Streptothrix*, given to this group of organisms. The addition of 0·1 mg. of crude material to 10 c.c. of nutrient agar inhibits the growth of *Bact. coli* and various other Gram-negative bacteria; among the Gram-positive bacteria some like *Bacillus subtilis* and micrococci are more sensitive. Gardner and Chain in the same year (1942) isolated the bacteriostatic substance from the *Proactinomyces* group which they called "Proactinomycin." This substance is active against Gram-positive organisms and *Neisseria*. Proactinomycin has the great disadvantage for chemotherapeutic purposes of being toxic.

The Antibiotic Substances produced by Moulds

The most interesting micro-organisms producing antibiotic substances are those of the genera *Penicillium* and *Aspergillus*. That the moulds are possessed of curative properties has probably been known among peasants for a very long time. I have often observed during holidays in the Polish Carpathians that the highlanders used stale bread on wounds or cuts. The subject was overlooked by scientific workers until 1929, when Professor A. Fleming discovered Penicillin. Professor Fleming, who was working on the variation of staphylococcus colonies, noticed on a culture plate that staphylococcal colonies in the neighbourhood of a mould had faded away. He followed up this observation and identified the mould as *Penicillium notatum*. In the liquid medium he showed that the culture fluid diluted some 500 to 800 times would completely inhibit the growth of staphylococci, and it was therefore some two or three times as strong in that respect as pure phenol.

Following Fleming's work, Clutterbuck, Lovell and Raistrick (1932) endeavoured to isolate penicillin. They showed that penicillin was formed when the mould was grown on a synthetic culture medium and this they thought would facilitate its isolation. Further investigation on the constitution of penicillin and its therapeutic effect and on the preparation of larger amounts of penicillin have been carried out in Oxford in the Sir William Dunn School of Pathology by Professor Florey, Chain and others (see *Brit. med. Bull.*, 1944). Their systematic study has led to the preparation of new compounds of biological interest.

Abraham and Chain (1942) found that from the elementary analysis of the barium salts of penicillin, formulae such as $C_{24}H_{32}O_{10}Ba$ and $C_{23}H_{30}O_9N_2Ba$ are possible. Catch, Cook and Heilbron (1942) obtained by their method, in the form of the strontium salt, analytical figures in agreement with the formula $C_{24}H_{34}O_{11}NSr$. The purest preparation of penicillin so far obtained inhibits the growth of staphylococci in a dilution of one part in 50 millions. Penicillin even in strong solution does not kill bacteria immediately, but merely inhibits their growth. The pathogenic organisms may be classified as penicillin sensitive and penicillin insensitive.

Penicillin sensitive organisms are: *Staphylococcus*, *Streptococcus*, *Pneumococcus*, *Gonococcus*, *Meningococcus*, *C. diphtheriae*, *B. anthracis*, *Clostridium*, particularly *Cl. welchii*, *Actinomyces bovis* and *Spirochaeta pallida*. Penicillin is readily absorbed after intramuscular or subcutaneous injection but not after oral administration, since it is destroyed by the hydrochloric acid of gastric juice.

Penicillin appears to be a drug with which a striking therapeutic effect can be produced. When penicillin becomes cheap and abundant it may be used in veterinary therapy also. The only barrier now standing in the way of large-scale therapeutic application is the scarcity of material. Great efforts are being made by Institutes in Great Britain and in America to bring production to a maximum.

The discovery of penicillin stimulated the researches of other species of Penicillium and Aspergillus. Oxford and Raistrick (1935) found that cultures of *P. cyclopium* produced a relatively large amount of penicillic acid, a compound which was first isolated by Alsberg and Black (1913) from a mould, *P. puberulum*, and which chemically may be regarded as a derivative of tetronic acid. Penicillic acid is particularly active against members of the colon-typhoid-paratyphoid group.

In 1943 Raistrick *et al.* isolated from Penicillium patulum an antibiotic substance which they named "Patulin." They claimed that this substance is effective in combating the common cold, but their observations have not been confirmed by Stuart-Harris *et al.* (1943). Patulin is identical with "Claviformin," a product of *P. claviforme* (Chain *et al.*, 1942, 1944). Both substances are toxic to animal tissues in concentrations which render any therapeutic application unlikely and, moreover, their action is inhibited to a considerable extent by serum.

After the genus *Penicillium*, the most promising group is *Aspergillus*. The least toxic antibiotic, apart from penicillin, appears to be helvollic acid obtained from the culture of *Aspergillus fumigatus mut. Helvola Yuill* (Chain, Florey, Jennings and Williams, 1943). In bacteriostatic activity it resembles penicillin, having little action on intestinal Gram-negative bacteria but inhibiting the growth of Gram-positive cocci and of Gram-positive bacilli of the gas gangrene group in high dilution.

Recently the work of Philpot (1943) has shown that *Aspergillus*

Antibiotic Substance	Source	Authors	Organisms affected	Toxicity
Group of Organisms : Bacteria				
Pyocyanine	Pseudomonas pyocyanea	Bouchard, 1888	Largely Gram (+)	Toxic
		Emmerich & Loew, 1899		
a-Oxyphenazine		Schoental, 1941	Gram (+)	Slightly toxic
Lytic agent		Wrede & Strack, 1929	Gram (—)	
			V. cholerae	Slightly toxic
		Dubos, 1939	Gram (+)	Toxic
Gramicidin / Tyrocidine	Bacillus brevis	Dubos & Hotchkiss, 1941		
Tyrothricin		Gordon, Martin & Synge, 1943	Gram (=)	Toxic
Group of Organisms : Actinomycetes				
Actinomycetin	Actinomyces albus	Gratia & Dath, 1924	Gram (+)	Toxic
			Gram (—)	
			Gram (+)	Toxic
Actinomycin A	Actinomyces antibioticus	Waksman & Woodruff, 1940	Gram (—)	
Actinomycin B			Gram (+)	Toxic
			Gram (—)	
Strep othricin	Actinomyces lavendulae	Waksman & Woodruff, 1942	Various Gram (+) and Gram (—)	Slightly toxic
Proactinomycin	Proactinomyces Gardner	Gardner & Chain, 1942	Predominantly Gram (+)	Toxic
Group of Organisms : Fungi				
Penicillic Acid	Penicillium puberulum	Alsberg & Black, 1913	Gram (+) and (—) particularly typhoid paratyphoid group	Toxic
	P. cyclopium	Oxford, Raistrick & Smith, 1942		
Penicillin	Penicillium notatum	Fleming, 1929	Various aerobic and anaerobic bacteria	Non-toxic
		Chain *et al.*, 1940		
		Abraham *et al.*, 1941		
Citrinin	Penicillium citrinum	Raistrick & Smith, 1941	Gram (+)	Toxic
Gliotoxin	Trichoderma lignorum	Weindling & Emerson, 1936	Gram (+)	Toxic
	Gliocladium fimbriatum	Dutcher, 1941	Gram (—)	
Fumigatin		Anslow & Raistrick, 1938	Gram (+)	Toxic
		Baker & Raistrick, 1941		
	Aspergillus fumigatus	Oxford & Raistrick, 1942	Gram (—)	
Fumigacin		Waksman, Horning & Spencer, 1943	Gram (+)	Toxic
			Gram (—)	
Claviformin	Penicillium claviforme	Chain, Florey & Jennings, 1942	Gram (+)	Toxic
			Gram (—)	
Patulin	Penicillium patulum	Raistrick *et al.*, 1943	Gram (+)	Toxic
			Gram (—)	
Aspergillic acid		White & Hill, 1943	Gram (+)	Slightly toxic
			Gram (—)	
Flavicin	Aspergillus flavus	Bush & Goth, 1943	Gram (+) and some Gram (—)	Slightly toxic
Helvollic Acid	Aspergillus fumigatus mut. Helvola Yuill	Chain, Florey, Jennings & Williams, 1943	Gram (+)	Slightly toxic
			Gram (—)	
Gigantic acid	Aspergillus giganteus	Philpot, 1943	Similar to penicillin	Non-toxic
Clavicin	Aspergillus clavatus	Waksman, Horning & Spencer, 1943	Gram (+)	Toxic
			Gram (—)	

giganteus and *Aspergillus flavus* produce the antibiotic substances, namely, gigantic acid and flavicin, which are very similar to penicillin in their chemical and biological properties.

It is of interest that the production of antibiotics chemically similar to penicillin is not confined to the genus *Penicillium* but that they are produced by at least two or even more species of *Aspergillus*. These substances (see Table), *e.g.*, Aspergillic acid, fumigacin, fumigatin and clavicin, have the disadvantage of being fairly toxic to animals. Although most of the antibiotic substances have been obtained in the pure crystalline state, their chemical constitution has in most cases not been elucidated. Many of them, like penicillin, are of hitherto unknown chemical type. The list of antibiotic substances grows almost daily, and the work with antibiotic substances produced by living organisms will in a few years probably result in the discovery of several more powerful chemotherapeutic agents.

I close this review with the words of Professor Gratia, spoken in Paris at the Congress of Bacteriologists in October, 1938. "Il est fréquent de voir les progrès de la science s'opérer dans le tumulte de bouleversements politique et sociaux comme s'il existait une contagion une sorte de virus révolutionaire." M. A. Soltys.

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CORNWALL W.A.E.C.'s LIVESTOCK IMPROVEMENT PROGRAMME

In common with other counties, Cornwall has been asked by the Minister of Agriculture to take all practicable steps to bring the quality of its livestock to as high a standard as possible. Plans of the County W.A.E.C. (states the *Farmer and Stock-Breeder*) are: To carry out a detailed survey of the part played by livestock now on Cornish farms; creation of a cattle register to aid in the better utilisation of best breeding resources; consolidate by persuasive means the livestock policy on those farms which appear to lack any constructive plan, and to assist in framing a policy suitable to the individual farmer.

Where disease is a limiting factor, the Committee will bring in the Ministry's veterinary service for guidance as to its elimination. Generally, this will foster the adoption of a sound breeding plan for livestock for present needs, and capable of meeting any demands arising in the days of adjustment to peace-time conditions.

THE VETERINARY RECORD

June 24th, 1944

CHEMOTHERAPY

THE control of various bacterial diseases by modern methods of chemotherapy has opened new fields in which the practitioner can play an important part. Of necessity, preliminary trials of new agents must be undertaken in the laboratory under strictly controlled conditions so that some guidance can be given as to the relative toxicity for different species and the probable dosage necessary to arrest the diseases against which these drugs are likely to be effective. Nevertheless, the results obtained by therapeutic trials which may be highly favourable and statistically significant in regard to experimental infections, are not always confirmed by the clinician. It is highly desirable, therefore, that at all times the laboratory worker and the practitioner should keep in close touch.

As the value of certain drugs, particularly the sulphonamides, in arresting some specific bacterial diseases mainly of the acute type, is not in doubt, they should be used by the practitioner on suitable cases. It is unfortunate, however, that enthusiasm is sometimes apt to override discretion and there is a tendency both in the medical and veterinary fields to resort to these agents on all and sundry occasions irrespective of the type of condition or nature of the invading micro-organism. This trend is to be deprecated as being unscientific and unlikely, in the long run, to yield results satisfactory to the client or gratifying to the practitioner. In general, these chemotherapeutic agents are most effective when treatment is concentrated over a short period of time using the maximum tolerated doses. A prolonged application of insufficient amounts of these drugs is likely to defeat the object in view, *viz.* the rapid destruction of the organisms within the host. In addition, a knowledge of the limitations of these agents is highly desirable since this new and promising line of attack will quickly become discredited if an inappropriate substance is used, *e.g.*, sulphanilamide against a staphylococcal infection.

A further reason for caution lies in the increasing recognition that certain micro-organisms, through contact with these agents, quickly react defensively by producing mutants which are drug resistant. This phenomenon has long been recognised by workers in the field of protozoology since efforts at controlling such diseases as trypanosomiasis by chemotherapy have often been frustrated through the appearance of mutants with an acquired tolerance to the drugs used.

Recently McIntosh and Selbie[1] by means of a special technique have found, in common with other workers in this field, that, *in vitro*, organisms may become resistant to chemotherapeutic substances. The mechanism is believed to be a training of a bacterium to alter its metabolism in such a way that it becomes less sensitive to the drug in question. These workers have made the important observation that organisms rendered resistant to one agent have often acquired a tolerance to drugs of a completely dissimilar chemical composition; thus, cultures surviving the action of propamidine were unaffected by certain members of the acridine group. It is also worthy of note that once acquired, resistance seems to be a permanent feature of these mutants.

The actual mechanism which controls the production of drug resistant strains is, as yet, imperfectly understood, but the implications are far-reaching. In this connection it may be profitable to consider the lessons to be learned from the field of insect pest control by chemical means in which, as pointed out by Ripper[2], "an increasing amount of experimental proof has accumulated during recent years showing that this method has a very serious limitation. Repeated applications of chemical control result in an unintended artificial selection of those mutants within the pest population which happen to be resistant to the poison used. The progeny of these surviving mutants develop races of the pest which are more difficult to control than the general population."

Certain trials of this type have been carried out over a period of 25 years and more. They have shown that whereas the initial measures taken to control pests have been highly successful, one spraying with the chemical selected being sufficient, effective control has become more and more difficult with each succeeding year. Thus, the codlin moth which was highly susceptible to arsenate of lead when spraying was first started in Colorado in 1894, became more resistant so that in 1900 two sprays were necessary to obtain adequate control and by 1930, eight, ten or even twelve were necessary. In some instances, the resistant mutants tolerate chemicals of a quite different composition.

In the case of mammalian diseases, insufficient time has as yet elapsed to indicate the possible effects of the wide application of recently developed chemotherapeutic drugs to the human and animal populations. Serious consideration should be given, however, to the phenomenon of drug tolerance lest resistant races of the common pathogenic organisms, *e.g.*, streptococci, pneumococci, etc., are evolved which are insensitive to any of the known chemotherapeutic agents. This development is less likely to arise if these drugs are restricted to those cases which are expected to respond rapidly and in which the invading organism is completely eliminated.

[1] McIntosh and Selbie, F. R. (1943.) *Brit. J. exp. Path.* **24**. 246.
[2] Ripper, W. E. (1944.) *Nature.* **153**. 448.

LIVESTOCK IN WALES

In a comprehensive resolution on livestock moved by Professor Ashby, the newly-elected Chairman, at a recent meeting of the Council of Agriculture for Wales, the Council expressed the opinion that there was a great need of an increase in numbers of livestock in Wales, which could be secured by economical methods, so as to raise the revenues and earnings of farmers. In regard to bovine stock, it was desirable to draw the attention of agriculturists and all the authorities concerned to the necessity of adopting breeding policies appropriate to the various conditions in different parts of the Principality. All possible steps should be taken to avoid, and any practicable steps taken to prevent, the mongrelisation of stock. Hill sheep flocks should be maintained by the various measures which might be necessary, and which had been described and recommended by the Hill Sheep Farming Committee of England and Wales and Scotland. Farmers of Wales would desire to reinstate poultry flocks which had been removed under war conditions, and to increase numbers in flocks which had been reduced. Suggestions were made as to supplying adequate feedstuffs, and it was felt desirable that an appropriate system of organised marketing should be continued or devised.

A motion having been submitted that every step should be taken to secure the utmost extension of veterinary treatment of herds of cattle for the eradication of abortion, Mr. J. D. Broome, Superintending Inspector of the Ministry, said the success of vaccinating calves had been proved, and the Ministry were now considering a scheme of calf vaccination on a voluntary basis.

The Council resolved to ask the Ministry for a memorandum on the subject and for the attendance at their next meeting of an inspector to explain the advantages of vaccination.

* * * * *

Weekly Wisdom

"*A page of history is worth a volume of logic.*"—Mr. Cordell Hull, quoting Oliver Wendell Holmes, late Judge of the United States Supreme Court.

CLINICAL COMMUNICATION

Dislocation of Bovine Hip*

H. HOLROYD, jun., M.R.C.V.S.
Blackburn

I wish to describe the condition of dislocation of the coxo-femoral articulation and its reduction as seen in the bovine animal.

Very little is to be found in text-books except that it does occur, that nothing can be done to reduce it, and the only thing to hope for is the formation of a false joint while the animal is fattened for beef.

The condition as seen in the bovine nearly always affects the cow and is characterised by its sudden occurrence, usually through the animal slipping in the shippon or after she has been "riding" another cow and slipping when coming off her awkwardly.

Either limb may be affected and it is possible that both hips may be dislocated at the same time.

The affected limb is carried in a characteristic way, the leg being held stiffly with full extension of the stifle and hock joints. The long axis of the limb points in an outward and forward direction, so much so that the foot of the affected limb may be 18 inches or more in front of the opposite hind foot. Although the limb is fully extended the foot in many cases does not touch the ground. An almost infallible diagnosis can be made by this characteristic position of the limb. In some cases the head of the femur can be felt lying in the obturator foramen by rectal examination.

The method of reduction, which has been carried out successfully for some considerable time, consists in casting the animal, preferably with a body rope, in a double stall of the shippon or other suitable place, with the affected limb uppermost. She is placed flat out, crosswise in the stall. A piece of 3 × 2 in. timber about 4 ft. long is obtained and placed in a position well up in the groin between the inside of the affected limb and the udder. This is made secure by fastening a length of rope to one end, passing it round the front of the stall and back to the other end of the piece of wood. This wood acts in three ways:—

1. As a lever in lifting the femur.
2. As a fulcrum.
3. As a means of keeping the animal in a fixed position.

Another rope is now fastened to the affected limb between the fetlock and hock joints and steady traction applied, keeping the foot as close to the ground as possible. It is usual to start with three men pulling, but in some cases it has been found that the pulling force of at least five is necessary. The direction in which traction is applied is also of importance. Most cases are reduced by pulling in a direction at right angles to the body, but in some it is necessary to exert traction in a forward direction, even to as much as 30 degrees. In a few cases it has been necessary to pull the limb in a backward direction. During this stage the surgeon stands behind the animal directing operations and with his hand on the region of the hip joint. Immediately before reduction the great trochanter of the femur can be felt rising and almost immediately the femur regains the acetabulum with a distinct "flop." At this moment the surgeon must be prepared to give the order "stop pulling" to his assistants. A great amount of pulling is often needed, but it is usually found that the greater the amount of power necessary to replace the dislocation, the greater is the chance that the joint will stay in place.

The chief points to remember are:—

(*a*) That the animal is absolutely flat.
(*b*) That traction be steady and not at the least jerky.
(*c*) That the foot be kept close to the ground.
(*d*) That your assistants immediately respond to your orders.

After-treatment consists in placing the animal in a narrow level stall, preferably with the affected limb against a wall; if this is not possible, the stall division should have a piece of wood, at least a foot high, extending to the dung channel. The width of the stall should only be sufficiently wide for the animal to lie down, approximately 3 feet. The animal is kept perfectly still for a period of four to five days, after which the stall is made wider for about another fortnight. At the end of three weeks recovery ought to be complete with no lameness or anything to indicate that the hip had been dislocated. In uncomplicated dislocations this method is 100 per cent. effective. Stimulating liniments or a blister may be applied to the region at the practitioner's discretion.

A complication sometimes met with in hip dislocations is a fracture of the acetabulum. In these cases reduction of the dislocation is relatively easy, *i.e.*, little traction is necessary, but immediately afterwards or when the animal tries to regain her feet it will recur. It is sometimes possible to confirm a fractured acetabulum by rectal examination.

* Presented to the Annual General Meeting of the Lancashire Division, N.V.M.A., at Manchester, February 25th, 1944.

ABSTRACT

[Further Biochemical Studies of Pregnancy Toxaemia in Sheep. Underwood, E. J., Curnow, D. H., and Shier, F. L. (1943.) *Aust. vet. J.* **19.** 164-173. (Dept. Agric., Western Australia.).]

Most of the data upon which this paper was based are from cases of pregnancy toxaemia which occurred in a large flock of Border Leicester × Merino ewes mated to Southdown rams and maintained during the last two months of pregnancy on poor green grazing. The following conclusions are drawn: (1) the serum Ca levels of the affected ewes were found to be slightly but significantly below those of normal healthy pregnant ewes, although no cases of definite hypocalcaemia were observed; (2) in both healthy and affected ewes, foetal blood-sugar levels were about double the corresponding maternal values, and there were no significant differences between healthy and affected animals; (3) the livers of most of the affected ewes were almost entirely depleted of glycogen, whereas those of all healthy pregnant ewes examined (with a single exception) contained much higher reserves of glycogen; (4) there was no significant difference between the liver glycogen contents of the foetuses of healthy ewes and those of the foetuses of affected ewes, while the average content of each foetal liver was as high in twin as in single pregnancies; (5) the liver vitamin A reserves were quite high in both healthy and affected ewes (thus confirming the observations of N. S. Barron, 1942, *Vet. Rec.* **54.** 29).

In the light of these observations, and of recent experimental studies on carbohydrate and ketone metabolism, the authors suggest the following as the sequence of metabolic events in the ewe affected with pregnancy toxaemia:—

"During the latter part of pregnancy additional demands are made by the developing foetus and its membranes and the uterus and other reproductive apparatus of the mother, especially in twin pregnancies, due to the nutritive requirements for the metabolism, growth and carbohydrate reserves (liver glycogen) of the foetus and its supporting tissues. These foetal requirements take precedence over those of the mother, as evidenced by the fact that the high foetal liver glycogen reserves and blood sugar levels are maintained even under conditions of hypoglycaemia and almost complete exhaustion of liver glycogen in the mother. As long as the plane of nutrition of the ewe is adequate, its own requirements and those of pregnancy can safely be met. But when the caloric value of the diet of the mother is low over a period of several weeks or even days . . . the maternal organism suffers. (In our experience this means a plane of nutrition insufficient to promote small but consistent live-weight increases during the last two months of pregnancy.) Deglycogenation of the liver occurs and the ewe is forced to try to meet its energy requirements by metabolising its own tissues. Fat is mobilised into the liver for this purpose and broken down there to the 'ketone' stage, that is, aceto-acetic and B-hydroxybutyric acids. These are normal metabolic products which can be utilised by the muscles in appreciable amounts, but little if at all by the liver. Carbohydrate is the preferential source of energy for this organ. In the absence of carbohydrate (exhaustion of liver glycogen) more fat is brought to the liver in a vain attempt to supply energy requirements and ketone bodies are produced at a rate that exceeds the rate of peripheral utilisation. Apparently the ketone bodies are not used in foetal metabolism, since the blood of the new-born lamb from ketonaemic ewes has been shown . . . to be free from ketones. The excessively fatty liver, ketonaemia and ketonuria which are normally characteristic of pregnancy toxaemia, therefore result." A. N. W.

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STOCK HEALTH AND PASTURE IMPROVEMENT

Presiding at the annual meeting in Aberdeen of the Stock Health and Pasture Improvement Association (North-East of Scotland), Lord Glentanar complimented the North of Scotland College of Agriculture on having acquired for experimental purposes the farm of Glensaugh, Kincardineshire. It was satisfactory to know that much of the field experimental work in regard to livestock health and hill pasture would now be carried on by scientists on a station which could be visited by the farming community. The College would have the active co-operation of the Association. There would be closer working arrangements between stock-owners, veterinary surgeons and experts of the College, that should facilitate diagnosis and treatment of diseases of animals.

* * * * *

A regular class in Equitation and Horsemanship is being conducted in Stalag 383, Germany, by a British Regimental Quartermaster Sergeant, and out of the original registration of 44 pupils, 31 have put in full attendance and none of the remainder has missed more than four lessons. The R.Q.M.S. has made a wooden horse and obtained a saddle for practical work, and has been allowed the use of one of the camp transport horses for an hour each week. —*National Horse Association News Sheet.*

IN PARLIAMENT

Milk and Dairies Bill

Mr. Hudson's Food and Drugs (Milk and Dairies) Bill met with more heavy weather in the House of Commons on Tuesday of last week, following the stiff but successful fight on second reading on the proposal to transfer from the local authorities to the Minister powers to control the conditions of milk production. After the money resolution had been agreed to on Report the House went into Committee on the Bill, and immediately a stormy debate arose over Clause 1 (Exercise of regulations).

Mr. Erskine-Hill moved an amendment ensuring that a dairy farmer would not be struck off the register or refused registration solely because, in the opinion of the Minister or his servant, the regulations would not be complied with, but only upon proof of some definite act or default on his part; that the dairy farmer was entitled to be heard himself and to produce witnesses; and that there should be the right of appeal to a court, which was independent and whose decision would be final. He said that, since the object of the Bill was to bring clean milk to the home, there ought to be a common rule affecting both the dairyman and the dairy farmer, with the same rights of appeal in each case. We had reached an extraordinary stage if a Minister was going to be allowed to settle the future of an individual simply by saying that it was his (the Minister's) opinion that that person was likely to transgress the law. The refusal to register or to cancel registration must be based on something which the man had done and which was capable of being proved. A decision affecting the livelihood of any citizen should not be based entirely on the opinion of a Civil servant. The surrendering of individual liberty and rights was too great a price to pay for clean milk.

Colonel Manningham-Buller said the Bill as it stood would place the dairy farmer completely at the mercy of the Minister, who would earn the title of "Dictator of Dairy Farming." He, Sir Edward Grigg, and others called for an independent tribunal, not appointed by the Minister of Agriculture, to which the aggrieved dairy farmer, actual or prospective, could appeal.

Mr. Hudson put up a spirited defence of the Bill as a necessary means of protection against unsafe and unclean milk. He yielded, however, to the strong pressure of the House to the extent of agreeing that a person refused registration as a dairy farmer should be allowed to appeal to a tribunal composed of the regional veterinary inspector of the Ministry of Agriculture and two other members one selected from a panel nominated by the Milk Marketing Board, the other from a panel chosen by the National Farmers' Union. Mr. Hudson insisted, however, that the final decision in each case should rest with the Minister.

This compromise was not acceptable to a very considerable section of the House. Members, including Sir Percy Harris, pressed Mr. Hudson to agree that the decision of the tribunal should be accepted. The Minister then gave the qualified undertaking that if the tribunal's decision were unanimous it would be regarded as final. Even this however, did not placate the supporters of the amendment, who insisted on a division from which it was obvious that a number of Members on both sides abstained.

The Government obtained a majority of 101.

Later Mr. Hudson announced that, assuming that the Bill was passed, he proposed to set up in every county an advisory committee consisting, broadly speaking, of his veterinary representative with some qualifications as a sanitary inspector, the medical officer of health of the county, some representatives of the local authorities —probably chiefly the county councils, but also one or two members, if agreed to, to represent the smaller authorities—possibly a member of the Milk Marketing Board and of the N.F.U., and a member of the war agricultural committee or its successor. That would be the general supervisory committee for the whole of the milk production in the particular county. He also proposed to set up a central advisory committee in London containing representatives from the various county committees. He would like to get agreement not only within the county but between the various counties. It meant approaching these matters in a realistic spirit.

The Finance Bill: Stud Farm Profits

With the House in Committee on the Finance Bill, Sir R. Glyn moved a new clause providing that in the computation of profits of a stud farm the receipts and expenses for training and racing the horses should be taken into account. He said that stud farming would be useless unless the progeny were tested, and the only way this could be done was by racing. The training and racing of horses should be treated as part of the stud farm business.

Sir C. MacAndrew said it was reasonable that racing expenses should be allowed to be offset against the stud farm profits and Mr. W. Astor that the export trade in thoroughbred horses had been a very steady and solid economic as well as prestige asset for generations. There was no question at all of relief for the rich.

Mr. E. Walkden (Doncaster), following other Labour members who expressed opposition to the clause, said that, representing a constituency that owned a racecourse, some might think he would support the clause, but he opposed it. The suggestion was wholly unreasonable.

Mr. Assheton agreed that it was important that the export trade in thoroughbred horses should be maintained and, after the war, increased. It was important that we should get as much foreign exchange as possible. The Government felt, however, that this was not the appropriate moment to make a concession of this kind.

The new clause was, by leave, withdrawn.

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Questions

Milk and Dairies Regulations (Enforcement)

Mr. Turton asked the Minister of Health in how many cases he has, acting under the powers vested in him by Section 93, Food and Drugs Act, 1938, empowered an officer of his Department to execute and enforce provisions in relation to Milk and Dairies Regulations, where he has been of opinion that a local authority has failed, in relation to the Milk and Dairies Regulations, to execute or enforce the provisions of the Food and Drugs Act, 1938.

Miss Horsbrugh: Section 93 of the Food and Drugs Act, 1938, relates to provisions of the Act which it is the duty of a Food and Drugs Authority to enforce. The authorities defined in the Act as Food and Drugs Authorities are not responsible for the enforcement of Milk and Dairies Regulations.

. . . . .

Farm Stock Diseases (Sulphonamide Drugs)

Mr. Wootton-Davies asked the Minister of Agriculture whether M. and B. is recommended by his Department for any diseases among poultry, cattle and sheep.

Mr. R. S. Hudson: Drugs belonging to the sulphonamide group, to which M. and B. 693 belongs, have been widely recommended by my Department for certain types of mastitis in cattle. No general recommendation of such drugs has, however, been given for other diseases of cattle or for diseases of poultry or sheep.

NOTES AND NEWS

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

June 27th.—R.C.V.S. Examinations begin (provisional date).
June 28th.—Meeting of the Society of Veterinary Practitioners, Deller's Café, Taunton, 2.15 p.m.
June 30th.—Meeting of the Lancashire Division, N.V.M.A., at Liverpool, 2.30 p.m.
July 6th.—Meeting of the Central Veterinary Society at the Conway Hall, W.C.1, 2 p.m.
July 10th.—Meetings of Committees, N.V.M.A., at 36, Gordon Square, W.C.1.
July 11th.—Meeting of Council, N.V.M.A., at the Connaught Rooms, Great Queen Street, Kingsway, W.C.2, at 1 p.m.
July 13th.—Meeting of the British Society of Animal Production, at the London School of Hygiene and Tropical Medicine, 10.30 a.m.

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"Questions and Answers" Column

A New Feature

Realising that there are very many questions which perplex the minds of veterinary surgeons from time to time, the answers to which are not readily obtainable, the Editorial Committee has decided to institute a new feature for *The Veterinary Record*, to be called a "Questions and Answers" Column. We believe this will prove a most useful and interesting innovation and we hope that members will co-operate by sending us their queries on any veterinary matter whatsoever. These will be allocated to experts in the subjects under discussion, who will furnish replies, these representing exclusively their own opinion.

The names of questioners need not be published but should they not be, it would be necessary to publish a pseudonym for the purpose of identifying the question. The Editorial Committee reserves the right to scrutinise questions before publication with a view to the exclusion of extraneous or undesirable matter. Short correspondence in connection with the answers will be welcomed and will be appended to the "Questions and Answers" column.

Agricultural Research Council Secretaryship

Mr. J. C. F. Fryer, O.B.E., M.A., has been appointed Secretary of the Agricultural Research Council in succession to the late Dr. Topley. Mr. Fryer has been Director of the Plant Pathological Laboratory of the Ministry of Agriculture and Fisheries for many years, and in addition for the last three years has been acting as Secretary of the Agricultural Improvement Council for England and Wales.

* * * * *

PERSONAL

Retirement of Mr. Frank Ware, C.I.E., F.R.C.V.S., I.V.S.

The retirement is announced of Mr. Ware from the position of Animal Husbandry Commissioner with the Government of India, which he has held since 1938. His retirement in accordance with the age limit should indeed have taken place three years before, but the difficulty of making a satisfactory replacement, together with Mr. Ware's virility and worth, rendered necessary his continued retention.

Mr. Ware has had a long and distinguished career in India. He received his professional training at the Royal Veterinary College, London obtaining his statutory qualification of membership of the Royal College of Veterinary Surgeons in 1906 and becoming a Fellow of the College in 1921. In 1907 he entered the Indian Veterinary Service, assuming charge for two years as Assistant Principal, Bombay Veterinary College. In 1909 he was transferred to the Central Provinces for field training, remaining there till 1911, where he was given his first permanent appointment as Superintendent, Civil Veterinary Department, Madras. He remained in that Presidency for 18 years, leaving in 1929 to take up the position of permanent Director of the Imperial Veterinary Research Institute, Mukteswar. Mr. Ware succeeded Sir Arthur Olver as Commissioner with the Central Government and has recently been succeeded in turn by Major Grahame Williamson from the Edinburgh Veterinary College.

The development of animal husbandry work during Mr. Ware's office with the Imperial Council of Agricultural Research in India has been rapid. Few schemes of research in this field were in being in 1938, although much spade work had been done on this subject, but by 1943 there were more than 80 separate schemes to be supervised. The conception of these schemes, the task of piloting them through the many Committees of the Advisory Board, the selection of men capable of undertaking them, the watchfulness required for maintaining their balance, and their final translation into practice required no ordinary effort. Among particular projects set in motion in recent times were the activities connected with the All-India Cattle Show Society, the more recent Regional Shows, the Cattle Herdbook scheme. Projects continued and extended during his tenure were the Provincial and State Disease Investigation Scheme, the drafting of a model Contagious Diseases of Animals Act for All-India, definition of various breeds of cattle, sheep, goats and indigenous poultry. In addition, there were the innumerable more routine or day-to-day problems on which advice was required. It may truthfully be said that Mr. Ware over many years had spared himself no effort to become acquainted with the problems of Indian life on the animal side.

It is pleasing to know that Mr. Ware's services to India are not yet ended. In January, 1944, he joined the Government of the United Provinces as Director of Animal Husbandry and his work there will be mainly concerned with war-time needs of food production.

Births.—Heath.—On June 16th, 1944, to Effie, wife of G. B. S. Heath, B.Sc., M.R.C.V.S., Ravenglass, Cumberland—twin sons.

Spratling.—On June 18th, 1944, to Mair Eluned, wife of F. R. Spratling, 16, Queen's Road, Reading—a son.

Marriages.—Maffey—Dowling.—At St. Paul's Church, Woodford Bridge, Essex, on June 10th, John, only son of Mr. and Mrs. A. J. Maffey, of Thundersley, Essex, to Violet Josephine, youngest daughter of Mr. and Mrs. J. Dowling, of York.

Thomson—Malloch.—At Marlborough House, Glasgow, on June 15th, 1944, by Rev. John S. Lawson, Robert Henderson, M.R.C.V.S., Ellesmere, Shropshire, son of the late Rev. Andrew B. Thomson, B.D., Dalry, Ayrshire, and of Mrs. Thomson, 26, Woodlands Drive, Glasgow, to Helen Dunn, youngest daughter of Mr. and Mrs. Thomas Malloch, 55, Garthland Drive, Dennistoun, Glasgow.

Mr. Hudson's Record.—No more striking tribute to the high qualities of the Minister of Agriculture could be paid than is implicit in the fact that Mr. R. S. Hudson—whom the profession congratulates the more heartily for its own insistence on more and cleaner milk—has held office for a longer period than any other Minister of Agriculture since the creation of the office in August, 1919.

Promotions in the Colonial Veterinary Service.—The Colonial Office announces that the following Veterinary Officers in Tanganyika have been appointed to the grade of Senior Veterinary Officer: Messrs. W. A. Burns, M.R.C.V.S., G. S. Cowin, M.R.C.V.S., M. A. Molloy, M.R.C.V.S., and M. R. Reid, M.B.E., M.R.C.V.S.

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The Late Major Guy Sutton, F.R.C.V.S.

A Tribute

Mr. Harold Stainton writes:—

It is fitting that I should pay my tribute to the memory of Guy Sutton, for I am, in every respect, a mourner. His death has not only severed a long and happy partnership, but has robbed me of a very sincere friend and one whose example and advice have been invaluable.

The late Guy Sutton was born in 1877 and like many other men who have made their mark was left to fight his own battle by the early death of his father. His industry and thrift, however, enabled him to save enough money to send himself to College, from which he qualified in 1902.

He went as assistant to Batt's, of Oxford Street, and subsequently joined the late Sir Frederick Hobday in 1909. Two other important events of his life took place in the same year: he gained his Fellowship and he married Gertrude Mary Wolfe, who survives him. He leaves two sons and three daughters—all of whom are in their various spheres, doing important work of war-time urgency.

Guy Sutton had two absorbing passions—his family and the horse. He was essentially a horseman and his early career brought him into contact with such men as Hunting, Pritchard, John Coleman and Irving. When you could persuade him to talk, his reminiscences were of never failing interest.

During the last war he served in Egypt, Palestine and the Aegean Islands with the rank of Major. On demobilisation he returned to the Kensington practice, where he worked with indefatigable vigour up to his death on June 11th, 1944.

Now of the man himself as I knew him. First of all he was known for his transparent honesty and straight dealing. His patient was always his first consideration and he cared nothing for false sentiment on the part of the owner. He simply could not tolerate what he called "punk" and his outspoken remarks often made that clear. But he was always courteous and, since his death, I have encountered poor and elderly people, with their pets, who have relied on his courtesy and kindness.

One of his ideals is embodied in words that he often used: "Fear no man—say and do what you know to be right without fear or favour and regardless of the cost." He always practised this precept both personally and professionally. Of his personal courage I can only say that he carried on gamely in spite of certain physical disabilities. His faulty hearing barred him from any public activity or debate and, in consequence, I feel that much useful practical knowledge has been lost to the profession.

Guy Sutton has died as he would have wished, in harness, but to me and all his friends the loss is irreparable.

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Foot-and-Mouth Disease.—An outbreak of foot-and-mouth disease was confirmed on Monday last among pigs at Darwen, Lancashire.

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VETERINARY EDUCATION

In view of the letter from Professor Share Jones which appeared in *The Times* of May 29th and in the last issue of our journal, we feel that the following reply, which was sent to *The Times* by Dr. W. R. Wooldridge, and which was published on June 12th, should also be reproduced here.

To The Editor of The Times

Sir,—In his letter in your issue of May 29th Professor Share Jones implies that the Martin Committee in its report set a standard for the staffing of every centre of veterinary education. This was not so, as the Martin Committee's enquiry related solely to the Royal Veterinary College. The Loveday Committee has not reduced either the status or the stipend of any member of the staff of the Royal Veterinary College. On the contrary, its recommendations allow for an increase in both the number and some of the salaries of the staff of that College.

The Loveday Committee has recommended that various university centres be encouraged to organise courses of veterinary training, and in keeping with the normal standards of university instruction the Committee has recommended that each university institute its own degree in veterinary medicine, and that the degree, subject to certain safeguards of minimum standard of instruction and examination, shall entitle the graduate to become a member of the Royal College of Veterinary Surgeons. The bachelor degree of veterinary medicine is no more "a compulsor

degree of commercial value" than is any other degree in science or arts. The Loveday Committee expressed its view that universities undertaking veterinary training should establish a faculty in veterinary science; it did not make this a specific recommendation solely because faculty arrangements vary so much from university to university. The Loveday Committee nowhere suggests that "in order to secure financial support, the profession should surrender its form of government." The Committee was asked to report upon "the best possible training for the veterinarians of the future," and after full consideration of the present systems of training for advanced education in this country, including that for the veterinary profession, recommended that a modification be made in the present uni-portal entrance into the profession.

Having decided upon what it considered to be the best form of education that will "give veterinary education the standing and the opportunities for development which the increased and still increasing importance of the profession to the national economy deserves and requires," the Committee drew up its financial recommendations on this basis: that is, following this decision and not, as suggested by Professor Jones, preceding it. The uni-portal method of entry into the profession was maintained by retaining membership of the Royal College of Veterinary Surgeons as the only qualification for practice, and giving powers to the Council of the Royal College of Veterinary Surgeons to ensure both a minimum standard of instruction and qualification. In this way the uni-portal character of veterinary education is maintained, it remaining a one-portal system in so far as a minimum standard of qualification and the licence to practise is concerned, although each centre may set its standard of instruction and examination anywhere above this minimum.

Yours truly,

Bentley Hyde, Priory Drive, Stanmore. W. R. Wooldridge.

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A MEDICAL COMMENT ON THE LOVEDAY REPORT

The Veterinary Curriculum

In its review of the second report of the Loveday Committee on Veterinary Education, the *Lancet* (June 3rd) follows a summarised reference to the Committee's other recommendations with the following extended comment on the proposals more specifically affecting the veterinary curriculum.

"The committee feel that the adoption of their recommendations will open a broader path for veterinarians who desire to read for higher degrees in science, and will bring university and veterinary students into a much closer association. In general this view will be strongly supported, but there are dangers which must be appreciated and guarded against. The importance of integrating and correlating preclinical and clinical studies is well recognised; the outlook of veterinary medicine is different from that of human because the saving of individual life is not always the paramount objective, economic factors and the control of disease in the herd being equally or more important. It follows that the bias of the preclinical subjects for the veterinary student should be different from that of the medical student. The committee apparently recognise that pathology and bacteriology, and anatomy, are subjects which must be taught by specialists in the veterinary field; on the other hand, judging both by the content of the report and the proposed staffing they do not consider that physiology, biochemistry, genetics, parasitology and pharmacology require the same specialised study. This is surprising, for they are fully alive to the increasing importance of animal husbandry and the necessity of careful clinical training; and in the first report they recommend that there should be a second year of applied physiology which is the only sound introduction to clinical methods of diagnosis. It must be admitted that in the past pathology and bacteriology have dominated the picture; the physiology and biochemistry of the farm animals have not been studied to the same extent, but now that their importance is realised it is essential that senior posts in these subjects should be created capable of attracting the best men for teaching and research. Judging by the proposals for staffing and salaries, it would appear that the colleges will provide greater scope in these fields than the university schools. Physiology, biochemistry, genetics, parasitology and pharmacology are all subjects with a general scientific background but they can only be taught properly to veterinary students by veterinarians familiar with their particular application to veterinary problems, and with the facilities and inclination to pursue their studies in the animals concerned. Generalisations are not enough; a much more precise knowledge of these subjects as they apply to each species of the domestic animals is required; if this is not realised there is a danger that the whole orientation and outlook of the teaching may be wrong. William Youatt summed the matter up thus in the *Veterinarian* of 1839.

'We confess there are few things of which we have so much dread in the education of the veterinary pupil as these general systems of physiology, which are deemed by some persons to be so important. Every animal has a physiology of its own; and it is only by that knowledge of its conformation and its functions which it should be the object and duty of the attendant on that animal to acquire, that a useful and satisfactory practice can be grounded.'

"Research at teaching centres fulfils a larger purpose than at specialised research institutions; it not only increases knowledge but provides material for demonstration, and is a source of inspiration to both teachers and students. The committee rightly emphasise that adequate facilities and time must be available for the staff to conduct research. It again emphasises the importance of the field station and extramural teaching to obtain practical experience. It fully appreciates the importance of the ruminant in veterinary medicine, and it is therefore a little unexpected that it recommends the dog as the type of animal for dissection. The sheep would be just as easy or easier to obtain and the student would gain first-hand experience of the most important type with which he has to deal."

The notice concludes: "It is inevitable that some aspects of the report will be criticised; but this need not lead to disunity. If suitable modifications were made as a result of discussion and further experience the major recommendations of the report should ensure that developments in veterinary education and research will keep pace with those in other fields. On this all who are working for the prosperity of agriculture will be agreed."

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FUTURE MEETINGS

British Society of Animal Production.—At the meeting of the Society to be held at the London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C.1, on Thursday, July 13th, from 10.30 a.m. to 4 p.m., the subject of "The British Sheep Industry" will be discussed. The opening papers are: General Survey, Professor R. G. White, Bangor (10.30 a.m.); Hill Sheep, Mr. D. H. Dinsdale, Newcastle-upon-Tyne (11 a.m.); Sheep for Long Leys, Mr. T. L. Bywater, Leeds (1.30 p.m.); and Arable Sheep, Mr. J. F. H. Thomas, Salisbury (2.30 p.m.).

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal views of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

Letters to the Editor should reach the Office not later than by the first post on Monday morning for insertion in following Saturday's issue.

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VETERINARY EDUCATION AND THE LOVEDAY REPORT

Sir,—The vast amount of discussion which one has been privileged to hear and to read upon the subject of veterinary education in general, and the effect of the second report of the Loveday Committee upon it in particular, has been a disappointing revelation.

I had come to the conclusion that the profession was composed almost entirely of those who formulate their views and policy upon tradition and sentiment, blindly refusing, in the true die-hard manner, to face reality but adhering grimly to the principle that "what has been must always remain so."

It was, therefore, with a sense of hope and encouragement that I read Mr. Paul Crosfield's letter in your issue of May 27th. Here is a man, I felt, who was prepared to base his views on a careful consideration of the facts of the case. Like him, I am full of pride and gratitude for the achievements of the R.C.V.S., but this does not justify me in blindly refusing to see the directions in which that body has failed.

Mr. Crosfield has mentioned thirty million pounds of largely preventable disease. May I add our deplorable position in meat inspection and public health work. What of the position of the C.V.O. in the Animal Health Division, and our status in the public eye? Such thoughts might prove embarrassing to the staunch one-portalites.

Let us face realities and accept the fact that the R.C.V.S. was given unique powers for a particular purpose—to weld a number of often poorly educated people into a unified profession with a sound basic minimum standard. To a large extent, this purpose has been achieved, and we must look forward to greater progress. Why assume that methods which have, in the past, proved successful for a particular purpose are the only suitable methods to use in the future for a much wider purpose?

It is my honest belief that the recommendations of the second Loveday Report have gone a long way towards solving the difficult problem of retaining the advantages of a single governing body, whilst incorporating those of a wider and more liberal education.

Let us receive the report with gratitude, as a great step forward in our professional progress.

Yours faithfully,

49 Cambridge Street, Aylesbury, Bucks. L. Guy Anderson.

June 3rd, 1944.

Sir,—In his letter appearing in the *Times* of June 12th, the statement of Dr. W. R. Wooldridge that the report of the Loveday Committee makes no recommendation the effect of which would be the abolition of the uni-portal method of entry into the profession must, in the interests of exactitude, not be allowed to go unchallenged.

The uni-portal method is simply this: the R.C.V.S. was empowered by the Royal Charter of 1844 as the one and only body capable of examining candidates and deciding who is, and who is not, competent to obtain the academic qualification of M.R.C.V.S., which alone entitles the holder of such to that legal registration permitting a person to practise veterinary surgery in this country.

Quite contrary to what Dr. Wooldridge implies, it is not membership of the Royal College, as such, that constitutes the uni-portal system, nor has the maintenance of any minimum standard of qualification any bearing whatsoever on the question; if the words uni-portal mean anything at all it is that the R.C.V.S. is the sole examining body capable of giving a registrable qualification.

The Loveday Committee recommends that in addition to this sole registrable qualification, the Privy Council should authorise the Universities of Cambridge, Liverpool, Glasgow and Bristol to confer degrees in veterinary science which the R.C.V.S. is to be required to register. These various degrees would thus become legal licences to practise.

There would then be five distinct, separate and varying examining bodies permitted to confer registrable qualifications, and I challenge Dr. Wooldridge to say that this is anything other than the complete and total abolition of the uni-portal system.

Yours faithfully,

23, Queen's Gate Gardens, London, S.W.7. THOMAS LISHMAN.

June 13th, 1944.

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Sir,—It is apparent that, with the present "Loveday" crisis, the veterinary profession has attained one of the more critical phases of its history. I consider it unfortunate, therefore, that the "one-portal system" has become so blindly identified with the diehard attitude. It seems to me that there is a great deal more at issue and that the point made by the Committee regarding the status of the profession is not attracting due meed of attention. Considering that the training of a veterinarian is as long, as expensive as and in some respects more arduous than that of a doctor, it is lamentable that the former should occupy so much the lowlier position in the public estimation. I consider that however laudable the recently founded Veterinary Educational Trust may be, its foundation should have been preceded by that of a Public Educational Trust. In veterinary matters at this precise moment, the public's need for education is greater than ours.

The supremacy of the Royal College can be considered axiomatic but association with the universities is only part of the treatment necessary to elevate that supremacy to its due importance in the national life. Some of your correspondents have submitted the plaint that "given the funds we can put our own house in order." But it is not difficult to see that in confining ourselves to a narrow trade union attitude we never shall be given those funds. To use public funds we need public support and that cannot be obtained by bickering among ourselves, but by shouting with one loud voice. We would be advised to make use of the universities for our own dignity, of research for our own advancement and of publicity for our own profit. And no one knows better than our medical brethren that the greatest of these is publicity.

Yours faithfully,

Fishguard, Pembs. JOHN F. BRADLEY.

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Sir,—The last paragraph of chapter 3 of the Second Report of the Committee on Veterinary Education in Great Britain begins with the sentence:

> "The training of the veterinarian is, however, like that of a medical man, a training in an art as well as in science, and if degrees in veterinary science or veterinary medicine (by whichever name they may be called) are to be registrable qualifications to practise, the veterinary surgeon's clients need to be assured both that his education in theory has been an adequate basis for his technique, and that he has been well trained in diagnosis and in the practical work of surgery and obstetrics and of preventive and curative medicine."

The Committee apparently felt that to attain these ideals a field station and hospital were essential at each centre where veterinarians were to be educated and it modelled its recommendations for these field centres and hospitals on the experience already gained at Liverpool, and on the proposals put forward by that centre for a new field station and hospital.

It is regrettable that the Committee gave no details of the hospital or other accommodation, etc., that might be expected from the expenditure of the sums specified, but even at pre-war values a hospital for the various classes of farm livestock must necessarily be very limited when the cost is estimated at £8,175.

The Committee recommend that veterinary education centres should be extended to four universities and that the present veterinary colleges at London and Edinburgh should be continued; these six centres are to be built up so as to be in a position to produce 220 graduates annually—100 coming from the four universities and the remainder from the schools at London and Edinburgh. The estimated cost of yearly maintenance at pre-war values is £85,000.

In reading the Report the impression is formed that one, if not the principal justification for a field station, is that it will permit the creation of a hospital. Although the recommended hospitals may cost surprisingly little at each centre, the field stations in the aggregate will be quite expensive. More surprising, however, is the figure given for the maintenance of the six centres of veterinary education when it is realised that the £85,000 covers not only such charges as rates, upkeep of buildings and grounds, and materials for teaching, but also research in all departments of all the teaching centres and an extended advisory service to farmers at each centre. The maintenance of the hostels for 440 students in their two final years at the six field stations is not specifically budgeted for and possibly this will make further demands on the £85,000. It is, therefore, difficult to see how these all-important veterinary hospitals are to be maintained, but even assuming that the hospitals were provided with adequate maintenance out of the £85,000, is it going to be possible to find the patients which, except for those that die or have to be slaughtered, will eventually be returned to their owners?

The Committee say, "We do not venture to make precise recommendations as to the steps that should be taken at each institution in order to find teaching material for its hospital."

The Committee's modesty may be commendable but it does not excuse their evident failure to consider the difficulties of guarding against the transmission of contagious disease from patient to patient within the hospital. This danger may not have occurred to the Committee, although it is obviously one of the most serious difficulties confronting a veterinary hospital for farm animals where discharged patients are returned to the farm, and is one that should be considered and planned for, and which will add materially to the cost of construction and maintenance.

It will always be difficult, and sometimes impossible, to have certain types of cases under observation in veterinary hospitals, but hospital training should nevertheless be invaluable and 'teaching material' is always available in those animals destined for the slaughterhouse and for the knackery because of disease. No consideration has been given as to how this great wealth of clinical and pathological material might be used for the benefit of veterinary education.

Yours faithfully,

Moredun Institute, Gilmerton, Midlothian. A. D. McEWEN.

June 13th, 1944.

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R.C.V.S. COUNCIL ELECTION

Sir,—May I thank those members who voted for me in the recent Council election. Also do I wish those returned a happy and useful term of office.

Yours faithfully,

Blandford. F. BECKETT.

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Sir,—I wish to thank those members of the profession who voted for me in the R.C.V.S. Council election, and to assure all members of my active interest and endeavour in all matters appertaining to the welfare and progress of the profession.

Yours faithfully,

Southampton. G. N. GOULD.

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Sir,—I would like to thank all those who voted for me at the recent R.C.V.S. Council election. It will be my endeavour to help carry out what I believe to be their wishes. My thanks would have appeared earlier but for the fact that a letter written previously was not posted. I apologise for the delay.

Yours faithfully,

Maidenhead. P. J. SIMPSON.

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Sir,—May I be permitted through your columns to express my sincere thanks to those Fellows and members who recorded their votes in my favour at the recent election to Council of the R.C.V.S.

Yours faithfully,

Peterborough. W. K. TOWNSON.

June 18th, 1944.